**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: **Yasushi KANEKO, et al.**

Serial No.: **08/981,654**

Group Art Unit: **2871**

Filed: **January 8, 1998**

Examiner: **Dung T. Nguyen**

**P.T.O. Confirmation No.: 8315**

For: **LIQUID CRYSTAL SHUTTER AND METHOD OF DRIVING THE SAME**

Customer No. **38834**
Docket No. **971480**

**DECLARATION UNDER 37 C.F.R. §1.132**

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

June 10, 2004

Sir:

I, Mr. Yasushi Kaneko do hereby declare as follows:

1) I am an inventor of the invention described in claims 1 and 3 of the above-identified patent application.

2) I am an employee of Citizen Watch Co., Ltd., the assignee of this patent application, and I am a citizen of Japan.

3) I have reviewed the responses and the Office Actions in this application.

4) I have reviewed the Amstutz (USP 4,634,229) and Natsunaga (USP 5,548,423) references and am familiar with them.

5) Amstutz does not disclose a liquid crystal display that falls within the limitations set froth in claims 1 or 3 of the above-identified application.

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6) In support of paragraph 5, I have prepared the comments below, which, in combination with the attached Exhibit A, clearly show that the ranges of Amstutz do not fall within claims 1 or 3 of the above-identified application.

7) In **Exhibit A** (which forms a part of this declaration) I included data in **Table 1** in a case in which $\Phi$ is 190°, which is close to 180°, as a modified example of the present invention, in addition to a case in which $\Phi$ is 240° in an example of the present invention (**Table 1**, 1st and 2nd rows). **Exhibit A** also contains a discussion on how to calculate angles $\beta$ and $\gamma$ in a case of $\Phi = 190°$. Even though $\Phi$ has another value, $\beta$ and $\gamma$ can be calculated in the same manner.

As to data of **Amstutz**, the case of $\Phi = 270°$ and $\Psi = 90°$ is not disclosed as an example in **Amstutz**, but it is calculated as a modified example. Therefore, additionally included in **Table 1** modified example of Amstutz 1 is for a case of $\Phi = 270°$ and $\Psi = 90°$, and also modified examples of Amstutz 2-5 are for cases of $\Phi = 240°$ and $\Phi = 190°$, (**Table 1**, 3rd to 8th rows). **Exhibit A** also contains a discussion on how to calculate angles P1, P2, and $\Psi$ in a case where $\Phi = 190°$.

The data shown in **Table 1** proves that a twisted angle ($\Phi$) in the range of $180° < \Phi \leq 260°$ and angles P1, P2 in the range of $\pm 40°$ to $\pm 50°$, as required in claim 1 of the present application, neither the disclosed Amstutz, nor a modified example of **Amstutz** can form a crossed absorption axes angle of two polarizing plates at 90°.

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The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under ' 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this 18th day of June, 2004

Yasushi Kaneko

Yasushi Kaneko

Title: Manager

Citizen Watch Co., Ltd.

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# EXHIBIT A

TABLE 1
Comparison between Present Invention and Amstutz

| | Φ | Ψ | P1 | P2 | γ | β | γ + β | Meets Claim 1 Limitations |
|---|---|---|---|---|---|---|---|---|
| Example of present invention | 240 | 90 | –45 | +45 | 105 | 75 | 180 | Yes |
| Modified Example of present invention | 190 | 90 | –45 | +45 | 130 | 50 | 180 | Yes |
| Example of Amstutz | 270 | 60 | 75 | 15 | 60 | 30 | 90 | No |
| Modified Example of Amstutz 1 | 270 | 90 | 0 | 90 | 45 | 45 | 90 | No |
| Modified Example of Amstutz 2 | 240 | 60 | 15 | 75 | 45 | 45 | 90 | No |
| Modified Example of Amstutz 3 | 190 | 10 | –50 | 140 | 45 | 45 | 90 | No |
| Modified Example of Amstutz 4 | 190 | 90 | –90 | 0 | 85 | 5 | 90 | No |
| Modified Example of Amstutz 5 | 190 | 90 | 0 | 90 | –5 | 95 | 90 | No |

Φ: twisted angle
Ψ: crossed absorption axes angle of a pair of polarizing plates
P1: angle of intermediate liquid crystal molecules and an absorption axis of upper polarizing plate
P2: angle of intermediate liquid crystal molecules and an absorption axis of lower polarizing plate
β: angle of upper liquid crystal molecules and absorption axis of upper polarizing plate
γ: angle of lower liquid crystal molecules and absorption axis of lower polarizing plate

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HOW TO CALCULATE DEGREE OF ANGLES

Present Invention (in a case of $\Phi = 190°$) : See FIG. A

1. Draw a horizontal axis (X axis) and a vertical axis (Y axis) on a paper. Draw axes of the upper orientation direction (upper LC) and lower orientation direction (lower LC) for a twisted angle ($\Phi = 190°$) so as to have the vertical axis being in the direction of the intermediate liquid crystal molecules.

2. Draw an absorption axis of a polarizing plate. Here, the absorption axes of an upper polarizing plate (upper PL) and a lower polarizing plate (lower PL) are positioned to have 45° difference respectively relative to the direction of the intermediate liquid crystal molecules ($P1 = -45°$, $P2 = 45°$) and to be orthogonal to each other ($\Psi = 90°$).

3. Measure angles ($\beta$) formed of the axis of the upper orientation direction (upper LC) and the absorption axes of the upper polarizing plates when it is viewed from the axis of the upper orientation direction. Here, the absorption axis of the upper polarizing plate (upper PL) viewed from the axis of the upper orientation direction (upper LC) forms an angle of 50° ($\beta = 50°$) counterclockwise.

4. Measure angles ($\gamma$) formed of the axis of the lower orientation direction (lower LC) and the absorption axes of the lower polarizing plates when it is viewed from the axis of the upper orientation direction. Here, the absorption axis of the lower polarizing plate (lower PL) viewed from the axis of the upper orientation direction forms an angle of 130° ($\gamma = 130°$) counterclockwise.

In other cases that angles satisfy $180° < \Phi \leq 260°$, e.g. a case of $\Phi = 240°$ in Table 1, $\gamma$ and $\beta$ can be calculated in the same manner as above.

Amstutz (in a case of $\Phi = 190°$) : See FIG. B

1. Draw a horizontal axis (X axis) and a vertical axis (Y axis) on a paper. Draw axes of the upper orientation direction (upper LC) and lower orientation direction (lower LC) for a twisted angle ($\Phi=190°$) so as to have the vertical axis being in the direction of an intermediate liquid crystal molecules.

2. In Amstutz, an angle ($\beta$) formed of the axis of the upper orientation direction (upper LC) and an absorption axis of an upper polarizing plate (upper PL) when viewed from the axis of the upper orientation direction, and an angle ($\gamma$) formed of the axis of the lower orientation direction (lower LC) and an absorption axis of a lower polarizing plate

(lower PL) when viewed from the axis of the upper orientation direction, are defined as $\gamma + \beta = 90°$ or $0°$. Therefore, the absorption axis of the upper polarizing plate (upper PL) and the absorption axis of the lower polarizing plate (lower PL) are drawn with $\gamma = 45°$ and $\beta = 45°$ being adopted, for example.

3. Measure an angle (P1) formed when the absorption axis of the upper polarizing plate (upper PL) is viewed from the direction of intermediate liquid crystal molecules. In this case, $P1 = -50°$. Similarly, read an angle (P2) formed when the absorption axis of the lower polarizing plate (lower PL) is viewed from the direction of the intermediate liquid crystal molecules. In this case, $P2 = 140°$.

4. Measure an angle ($\Psi$) formed of the absorption axis of the upper polarizing plate (upper PL) and the absorption axis of the lower polarizing plate (lower PL). In this case, $\Psi = 10°$. $\Psi = |P1 - P2| = |-50 - 140| = 190° = 180° + 10° = 10°$.

In case of $\gamma = 85°$, $\beta = 5°$ or $\gamma = -5°$, $\beta = 95°$, $\Psi$ will be $90°$, and P1 and P2 are $0°$ or $\pm 90°$. It means it is difficult to make the present invention condition ($\Psi = 90°$, $P1 = \pm 40° \sim \pm 50°$, $P2 = \pm 40° \sim \pm 50°$) from Amstutz condition ($\Upsilon + \beta = 90°$).

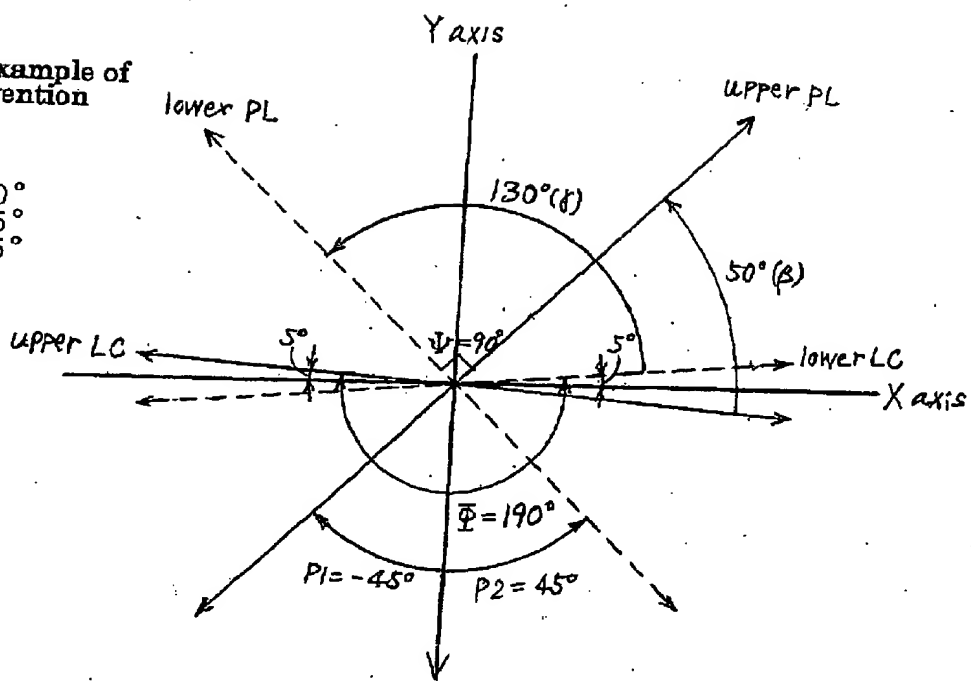
In other cases that angles satisfy $180° < \Phi \leq 360°$, e.g. cases of $\Phi = 240°$ and $\Phi = 270°$ in Table 1, P1, P2, and $\Psi$ can be calculated in the same manner as above.

FIG. A

Modified Example of Present invention

condition

$\Phi = 190°$
$P1 = 45°$
$P2 = 45°$



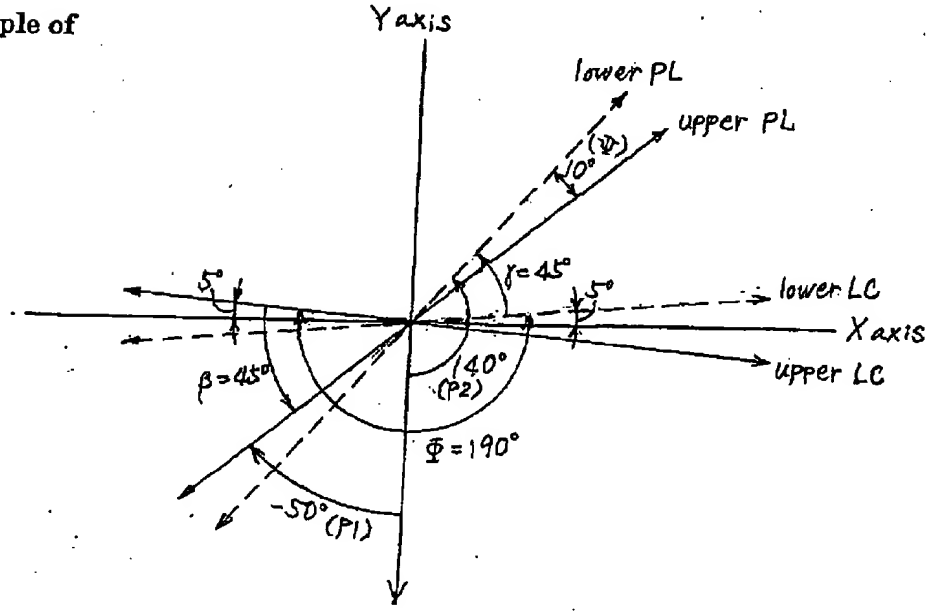

A direction in which intermediate liquid crystal molecules are oriented.

FIG. B

Modified Example of Amstutz 3

condition

$\Phi = 190°$
$\gamma = 45°$
$\beta = 45°$




A direction in which intermediate liquid crystal molecules are oriented